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A Study of the
Grounds
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no. 30
1908

Mich. Digest of Public Instruction

UNIV. OF MICH.

JUN 1 1908

Schools of Michigan

By the State
Superintendent
of
Public
Instruction

Bulletin No. 30,
1908.

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1908



118
SCHOOL GROUNDS

AND

SCHOOL ARCHITECTURE

FOR

THE SCHOOL OFFICERS

OF

MICHIGAN

1908

L. L. WRIGHT

Superintendent of Public Instruction

"Given a good teacher, a schoolroom constructed, heated and ventilated according to approved methods, and a healthy public sentiment in a rural school district, and the best city school cannot furnish more wholesome and stimulating conditions for the education of the children of our cities, than our rural schools favored by such conditions, do for the children in country districts."

"Children as well as older people are affected by their environments, and nowhere is this more clearly shown than in the schoolroom. The silent beauty radiating from the harmoniously tinted walls and ceilings; from beautiful decorations consisting of pictures, casts and plants, quickens and purifies the taste. Such beauty of surroundings has a subtle, silent, ethical influence which is not so much seen as felt."

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SCHOOL GROUNDS AND SCHOOL ARCHITECTURE.

Some years ago the Department published a pamphlet on the subject of school architecture. The calls for this pamphlet have been so numerous that the edition is exhausted, and I therefore deem it advisable to issue a second pamphlet on the same subject.

Until recent years little attention was given to the matter of school architecture. Contracts were let to builders who had no experience or training along the line of sanitary science or architecture, and as a consequence our state is dotted over with school buildings, both in country and city, which are insanitary, improperly constructed, poorly lighted and without proper means of ventilation.

Within the past fifteen years architects have begun to give special study to the subject of school architecture, and researches in sanitary science have brought out ideas which if incorporated into our school buildings will prevent much sickness, and also prevent that too frequent occurrence, of young people breaking down during their school career. In almost every instance where young people have been obliged to leave school because of failing health the cause has been ascribed to matters which are not connected with the school, and we find that in a large number of cases the direct cause of these break-downs is improper light, heating, ventilation and sewage.

In constructing school buildings it should be a cardinal principle that we do not need highly ornamented and elaborate buildings, either interior or exterior. The towers and minarets and alcoves which we find in many school buildings are absolutely useless and in many instances unsightly and the money expended for them would produce much better results if it were used in installing proper heating and ventilating plants, and in providing suitable pictures and statuary and other works of art. In other words, the construction of a school building should be such as will assist in producing a healthy mind in a healthy body.

It is impossible to furnish detailed plans for buildings or to give specifications for each of the plans suggested herein. School boards or building committees, if they are pleased with any of these plans, may present them to any architect or builder, who can fill in the details and furnish proper specifications for construction. We give suggested plans for one-room, two-room, four-room, eight-room, and fourteen-room buildings. All these plans have been submitted to the sanitary engineer of the State Board of Health and have been approved by him.

We desire to present in this pamphlet general suggestions in regard to school sites, water supply, interior and exterior decoration, lighting, ventilating, and decoration of school grounds.

SCHOOL SITE.

In selecting a school site, size, soil, drainage, elevation, and convenience of approach must be considered. The time is at hand when every school

district will need a site large enough for its buildings, a play ground and a school garden. A rural school site, then, should contain not less than one acre, and it would be best in almost every instance to have two acres or more. For village and city sites the largest possible area should be secured in order that the children may have proper play grounds. The playground, care and supervision by teachers and superintendent, is an important factor in the education of a child, and in the future it should be so large a factor that ample area should be secured for the school site.

The soil should be dry and porous, and if it is not so naturally, it should be artificially drained. The frontage of the lot should be about two-thirds of its depth, and it should be the brightest, most healthful and most beautiful spot in the community and in rural districts should be located as near the center of the district as possible. As one travels through our great state it is pitiful to note here and there, on the corner of a highway or a four corners a schoolhouse standing on a bare plot of ground, where no attempt has been made to decorate or ornament the lot, where the fences are unsightly and the outbuildings are a disgrace to a civilized community. The early settlers of Michigan were anxious to destroy the forests in order that they might have the soil to cultivate, and in their eagerness they destroyed all trees, shrubs and vines within their reach, and we are just now beginning to realize the value of these things and are beginning to plant vines, shrubs and trees in our own home yards. Why should not the entire community unite in treating the school site as we treat our own home yards? I would suggest that the school board should interest the people of the district, the teacher and the children in the planting of trees, shrubs and vines, and I would suggest in every case that those which are indigenous to Michigan should be planted on the school site. Let me suggest a few.

For trees: the maple, tulip, walnut, poplar, birch, and elm. For smaller trees and shrubs the dogwood, sumach, witch hazel, prickly ash, and many others. For vines: bittersweet, woodbine, ivy and grape.

The trees should be planted in groups or groves, and the shrubbery should be planted in masses with large open spaces of lawn. Avoid rows and straight lines. Each outbuilding should be screened by a mass of shrubbery consisting of sumach, witch hazel, prickly ash and others. The vines should be planted so as to grow upon the buildings and twine around the fences. Straight lines are to be avoided even in the walks.

A community cannot afford to sacrifice quality of soil, sightliness, elevation and drainage to the single item of central location. The site should be elevated but not on a bleak hill. The school building in rural districts should be located near the center and slightly to the front of the lot, leaving the rear of the lot for the play ground, the front part of the lot to be reserved for trees, shrubs planted in groups, with large open spaces. The outbuildings for boys and girls should be located in the rear corners of the lot and the wood or coal house in the rear of the school building and comparatively near to it.

The area at the sides of the building may be decorated with flower gardens in which shall be planted perennial bulbs and shrubs, also plots of ground for annual flowering plants.

The value of such decoration in a school lot cannot be estimated. The influence of these surroundings will enter into the lives of the children and will stimulate them to a love of art and beauty, and influence their entire life.

WATER SUPPLY.

Section 4679 of the School Laws requires that the school board shall provide a water supply for the school. This means that they may put down a well on the school grounds or rent the use of some near-by well. This law applies more particularly in rural districts. An open well should not be permitted on the school grounds. In all villages and cities where there is a public water supply, the school rooms should be provided with drinking fountains and thus do away with the insanitary nuisance of drinking cups and water pail.

In rural districts where there is no public water supply the schoolroom should be provided with a wash sink, and over it a water tank, closed, and provided with a faucet. Each child should then have his own drinking cup. In this way we can protect the health of the children and the cleanliness of the schoolroom both of which are vital points in the training of childhood.

OUT BUILDINGS.

For rural schools the outbuildings should be located in the rear corners of the lot, and never side by side. For the average school they should not be more than six feet square and seven to eight feet high. They should be thoroughly sand painted, inside and out, and enclosed by a tight board fence seven feet high. This fence should be constructed about four or five feet from the buildings.

The receptacle under the building for secreta should be of cement, water tight, and open at the rear for convenience in cleaning. Proper urinals with drainage into the soil should be provided either in the boy's closet, or better, on the inside of the fence above mentioned. The closets and urinals should be thoroughly cleaned frequently and the contents of the closet vault or receptacle should be covered with dry earth or coal ashes daily. The purpose of the cement vault is to prevent drainage into the soil and thus prevent possible contamination of the water supply. The contents of the vault should be taken out, thoroughly disinfected, or burned, at least once each term.

The matter of caring for these buildings is absolutely in the hands of the school board, and if there are any abuses the board is the proper legal body to see that they are corrected. The board should not attempt to shift responsibility upon the teacher or upon the big boys, although it would be a good plan for the board to consult with the large boys and secure their interest and co-operation in the care of these buildings, as well as the general care of the school property. The point we wish to emphasize is that the school board is absolutely responsible for the proper care, cleanliness and sanitation of the school property.

THE SCHOOL BUILDING.

(a) Basement. Every school building should have a basement. Enough of this basement should be above ground, that the windows shall be large and afford ample light for any use that may be desired to make of the room.

When a basement is not possible, the foundation walls should be of stone laid in cement, with small ventilators in each of the four sides. These ventilators may be made of three-inch tile extending through the walls, but

every rural school as well as village and city school should if possible have a fine, light, airy basement.

This basement under a rural school building may be partitioned for furnace room, a workshop and a kitchen. In the work shop, at an expense of from \$25 to \$50, three or four benches with manual training outfit may be placed. This will give an opportunity for the teacher to instruct the boys in the use of common tools and give them an opportunity to construct home-made apparatus for work in science and agriculture, also an opportunity to apply much of the ordinary academic knowledge to every-day practical uses and thus secure what all our people often ask for, "instruction in practical things."

In another apartment may be installed a cook stove, a table and a few cooking utensils, and these will give the teacher and the girls an opportunity for preparing warm dinners, and for gaining wholesome lessons in domestic economy.

All this is a "practical education" and can be secured at very small cost.

If the basement is not used for these purposes it may be used for a play room on stormy days.

The basement should be at least eight feet high, floored with cement, and there should be constructed on the walls cupboards and lockers in which may be placed dinner pails, tools, apparatus, kitchen utensils and other material so valuable for school work.

(b) Superstructure. The building, whether in rural district or city district, should be simple in construction and without unnecessary ornamentation. It should be made of good material and as nearly fire-proof as possible. Recent events have brought home to our people the importance of careful schoolhouse construction, and above all fire-proof schoolhouse construction. School boards and building committees should insist that in the construction of school buildings in all villages and cities, all material shall be of the best and that fireproof construction shall be used throughout. It should always be remembered that it is the interior of the school building that the children and teachers use, not the exterior, and instead of spending money to adorn the exterior it would much better be used in adorning the interior and in making the interior convenient, homelike and sanitary.

If one will ride through the country in Michigan he will be struck with the fact that our schoolhouses are nearly all constructed on the same model, an oblong building with three windows on each side, two at each end, a door in the front, an exterior or interior hall or entry way, a chimney at the wrong end of the building, the stovepipe running over the heads of the children, and altogether what may be called the "salt box" pattern after the log schoolhouse plan imported from our New England ancestors. This condition, no doubt, has arisen from the fact that the great majority of rural schoolhouses have been constructed by builders who had no experience or training other than that secured in erecting barns. A little time and thought on the part of any builder could produce a school building that would combine beauty of structure with convenience of interior.

In the older villages and cities of the state, we find the school buildings that were constructed from twenty-five to fifty years ago almost uniformly three-story structures, with shallow basements, steep stairways with heavy risers in the stairs, dark hallways, insufficient lighting and no means of ventilating except by windows and doors. These buildings were constructed by men who had no training in architecture or sanitary science, and they evidently thought that the higher they could make the buildings the purer air the

children might get. The modern architect insists that no school building shall be over two stories in height, with a good, high, light, airy basement.

COLOR OF EXTERIOR.

Buildings constructed of brick or stone have their color fixed, but for frame buildings such as are found in nearly all rural districts I would suggest the following for color of paint: light yellow with white trimmings; gray or buff tints with dark trimmings; light yellow with dark green trimmings; terra cotta with dark brown trimmings; plain white, and if blinds are used they should be green. If no blinds are used the window sashes should be black. These colors will be pleasing and will produce a variety.

SIZE OF THE SCHOOLROOM.

In general, the width should be two-thirds or three-fourths of the length. A room 24 x 32 should be twelve feet high and generally speaking the height of the schoolroom should not be less than eleven feet nor more than fifteen feet. The following rule will be a guide in planning the size of the rooms: the floor area should be sufficient to give each child not less than fifteen square feet of surface and he should have not less than 200 cubic feet of space. Schoolrooms generally should not be constructed so as to accommodate a larger number than thirty-five or forty children. If there are more than this number of children in the district, a two, three, or four-room building, or more, as the case may be, should be provided.

ARRANGEMENT OF SCHOOLROOM.

For a single room rural school I would suggest the following plan of arrangement of furniture and apparatus:

If a stove is used it should be in that part of the room nearest the door and in the rear of the pupils, and the chimney should be constructed at that end of the building, or at the side, so as to avoid running a stove-pipe over the heads of the children. The teacher's desk should be in the opposite end of the room from the door, thus the pupils will sit with their backs to the door, facing the teacher. The teacher's desk should be on the level floor and not on a platform. The blackboards should be in the rear of the teacher's desk, and at the side where there are no windows. The library case, dictionary, maps, and other apparatus should be placed in the room where they will be most convenient for both teacher and pupils.

The building should be constructed with a hall or entry way, which may be warmed, and in this ample provision should be made for hanging wraps and depositing dinner pails and all material not needed for every day use.

WINDOWS AND LIGHTING.

For a single room school, all things considered, it is best to have the house face the south or west. In this way the windows may be on the east and north or west and north sides, thus avoiding the glare of sunlight. All windows should be provided with opaque shades, of a color to harmonize with the finish of the room. The windows should be grouped close together on one side of the room, and this side should be at the left of the pupils when

seated. The right and front wall should be solid, that is, at the right and front of the pupils. There may be windows in the rear of the room, but if so they should be well elevated so that the light from them will come down over the pupils' shoulders. This avoids cross lights and light striking the children in the eyes. The bottom of the windows should be on a level with the pupils' eyes when seated, and they should extend to the ceiling. This is because a window throws into a room the maximum amount of light to the distance of once and a half its height. It would be an excellent plan, in buildings already constructed, if the windows on the right of the pupils and especially those in front of them could be closed up by building in the wall solid, and then at the left the window space should extend practically the whole length of the room. This would not be very expensive and would protect the eyesight of the children very materially. The area of glass in the windows should be equal to at least one-fifth of the floor space. If the largest body of light comes from the north this should be increased to one-fourth of the floor space, that is, in a room 24 x 32 there are 768 square feet in the floor, and there should be at least 153 square feet of glass in the windows. It must be remembered that children should never sit facing a window. It would be better if the shades could draw from the bottom up, rather than from the top down.

BLACKBOARDS.

All blackboards should be of slate. Slate costs only a little more than composition or other material that is sometimes used, and is much more durable, in fact it will last a lifetime.

In rural school buildings the blackboard should be forty-two inches wide and come down to within twenty-four inches of the floor. Blackboards should be placed on the walls where there are no windows. They should never be put between windows. In a room as above described there would be a blackboard in front and on the right side. In grammar rooms and high school rooms the lower edge of the blackboard may be three feet from the floor.

FLOORS.

These should be of hardwood, maple preferred. All schoolroom floors should be double and deadened with building paper, tan bark, or other suitable material. In the fireproof construction the floor would be supported by reinforced concrete and probably covered with wood flooring.

DESKS.

Single, adjustable desks should be used in all cases. Double desks are unhealthful, insanitary and uncomfortable. The seat and back of desk should fit the child's body and the seat should be of such height from the floor as to permit the feet to rest upon it squarely. Seats of the same size should be placed in the same room with aisles from thirty inches to three feet in width. For rural schoolrooms desks of at least three sizes should be provided, No. 2, 3, and 5. No. 1 is the largest size desk for mature people suitable for halls and churches, and as the numbers increase to No. 6 the size of the desk diminishes. The distance between the back of the seat and the desk in front should not be less than nine inches, nor more than thirteen inches. For instance, for a No. 5 desk, the distance between desk and back

should be about ten inches and for No.'s 1 and 2, about thirteen inches. Or, another rule in placing desks is that the desk shall project over the seat about two inches.

In the average schoolroom, light colored desks are preferable as they harmonize easily with other school furnishings. Cherry and mahogany school furnishings should be used only in school rooms that are very light and where the wood trimming is in a dark color.

VENTILATION.

This is a very important factor and one that has been almost entirely neglected in years gone by.

In single room school buildings a simple and effective mode of supplying fresh air is to have an airtight, galvanized iron or other metallic conduit extending from the outer air, where its openings are covered with strong wire netting, through the foundation walls, under the floor, to a point beneath the stove, if a stove is used, then up through the floor, closely connecting with a galvanized iron or zinc jacket surrounding the stove. In this jacket, around the stove there should be a door for the fuel and draft entrances. Under the stove there should be a register placed over the pipe which conducts the air into the room. This conduit will permit the fresh air from out of doors to come into the room and be warmed by passing between the jacket and the stove, and will go up into the room and return to the floor and be drawn up into the ventilating shaft hereafter described. A cut-off should be provided in this intake pipe which may be operated from the inside of the schoolroom so that the opening in the pipe may be closed on windy days and in the morning when the fire is first built. The jacket surrounding the stove should be built not more than four or five inches from the stove and should extend at least to the top of the stove.

This fresh air conduit under the floor should be large enough to supply 1,800 cubic feet of air per hour to each occupant of the room when the natural movement of the air in the ventilating flues would not be very rapid, that is, when the temperature of the out-door air is about twenty-five degrees lower than that of the indoor air. The size of the flues for the supply of fresh air and removal of the vitiated air should be about the same and should be determined by the number of persons who will occupy the room and not by the cubical contents or floor space of the room.

As above mentioned, the minimum floor space of fifteen square feet should be provided for each occupant. A room 24 x 32 feet might accommodate as many as fifty persons and according to the standard just given that would require a total of 90,000 cubic feet of fresh air per hour. Assuming the height of the ventilating flue for this room, measured from the floor level of the room to the top of the shaft above the roof, to be twenty-five feet, it should have an interior area of six square feet.

The ventilating shaft must be warmed in order to be of much value and for this reason it should be built in connection with the chimney, with a thin partition between. In some cases, the chimney is a large shaft built down to the ground, and in the center of it is constructed a tile or galvanized iron flue, in to which the smoke pipe passes. The heat from the stove or furnace will heat this inside flue and thus warm the column of air about it and produce an upward draft. The ventilating shaft should open into the room at the floor, by a register, and if possible, the opening from the shaft into the room should be made larger than the inside measurement of the shaft, that is,

from the shaft to the interior wall the surface should slant outward, so that a register built in the wall is one-third larger than the area of the shaft. The register being thus wider than the shaft, should not be over sixteen inches in width up and down. No register should be wider than this because we desire to remove the lowest stratum of air which is the coldest and most likely to contain objectionable dust.

In many localities it would be just as cheap and much more effective to heat the schoolroom by a furnace instead of a stove, and in this case the ventilating shaft may be built in the same manner as indicated above, that is, the pure air flue will be built through the exterior wall and open into the air chamber of the furnace and the chimney will be constructed so that it may be warmed by the heat and smoke from the furnace flue.

In many of our one-room buildings which have already been constructed without proper means of ventilating, we may secure a fairly effective ventilation by building the pure air flue as above stated and having it open under the stove and surround the stove with a jacket. Then if the chimney is not built down to the floor, an eight or ten inch pipe of sheet iron or galvanized iron may be constructed and stood up on end by the side of the chimney coming down to within a few inches of the floor and resting upon rods so as to raise it several inches from the floor and at the top enter the smoke flue or the chimney above the point where the stove-pipe enters. This will provide means of getting pure air into the room and impure air out. The stove, of course, should be jacketed as above stated.

In buildings of more than one room, such as are needed in villages and cities, the best plan of heating is by steam and of ventilating by having a proper ventilating system constructed and fresh air forced into the room by means of power fans.

INTERIOR CONSTRUCTION.

For the ordinary one-room building there should be separate hallways for boys and girls, and each of these should be at least eight feet square and these should be connected with the schoolroom in such a way as to be warmed, as they are needed for wardrobe use.

In larger buildings the hallways should be made ample and they should never be so narrow as to prevent two files of marching students operating at the same time. Such a hall would be extremely narrow and in general we might say that a hall should never be less than ten feet wide.

The wardrobes should be large enough to allow a separate hook for the wraps of each child and these wardrobes should be well ventilated, and warmed in winter.

The stairways ought to be from five to seven feet wide, according to the number of children and the number of rooms, and in very large buildings the stairways would be wider even than seven feet, and at the foot of the stairs the width should flare so that in coming down the stairway the base should be wider than the stair proper. This will prevent any possible congestion in case of accident or fire.

In the stairs the risers should not be more than six inches in height and the treads twelve inches wide. There should be as few turns in the staircase as possible and it should be so constructed as to permit a teacher to command it from one position. The woodwork ordinarily should be light colored, and should always have the rub or dull finish. The ordinary varnish finish causes intense reflection of light and may be extremely harmful to the eye-

sight of the children. The woodwork should be as plain as possible so as to afford the least possible opportunity for accumulation of dust. The wainscoting and other woodwork may be of oak, birch or pine, finished in the natural color by being filled, varnished and rubbed.

COLORS FOR INTERIOR.

A pleasing appearance of the room depends more upon the coloring of the wall fixtures and furniture than upon any other single feature. The general rule is that the floor should be the darkest surface in the room except the blackboards. The wainscoting should be several shades lighter than the floor and the wall spaces above lighter than the wainscoting. If the wainscoting is to be painted, a good color is produced by putting a small amount of raw sienna and chrome yellow with white paint, thus giving what painters call cream white. The molding and finishing board of the wainscoting should be darker, or a light brown. If the wainscoting is finished in the natural wood of course it will carry its own color. The wall spaces not occupied by blackboards or wainscoting may be tinted a cream, gray, olive or buff. A satisfactory plan is to use one of these colors for the side walls and a lighter shade of the same color for frieze and ceiling. With abundant light one may use olive for side walls and buff for frieze and ceiling. Generally the tints should be of the lightest and most delicate shades and in no case should shades of red be used. Reds, purples, violets, ordinary blue, ultra marine blue, ordinary green, are trying colors to the eye and should never be used.

The window shades should be of a tint to harmonize with the wall but be slightly darker. There should always be a picture molding around the wall, near the ceiling. This will answer for a border or band, but in the absence of a picture molding it is a good plan to have simply a band of darker color than the wall and of a shade that will harmonize, running around the wall, from twelve to eighteen inches below the ceiling. This band would be from two to six inches wide and if used the picture molding may be placed upon it. Above this band or molding the tint should shade from the wall color to that of the ceiling which should be the same as the wall color only a much lighter shade or tint. All moldings and borders should be darker than the groundwork.

If the walls must be papered the same plan of shading and coloring must be observed with as nearly as possible the same coloring. The color of the walls should harmonize with the woodwork either by analogy or contrast. The window shades should be of the same tint as the walls or slightly darker.

The harmony of color should be preserved with reference to the light of the room. If the light is strong, darker shades of above colors should be used. With a north light predominating, "warm" colors such as light cream or light orange will give the impression of warmth to the otherwise cold blue of the air. This matter of finishing is really the artistic part of schoolhouse architecture and building committees should require their workmen to observe the general rules here stated.

It is for the school board to insist upon having the interior of the school-room properly arranged, tinted and decorated, and these matters should never be entrusted to a novice, nor should prejudice nor economy be permitted to work irreparable injury to the sight or health of the children.

In the following pages cuts are given showing the proper construction and arrangement of outbuildings and of one, two, three, and four-room buildings, together with cuts of buildings suitable for city and village schools. These

are merely suggestive, and architects will be encouraged to make any necessary changes in the plans, also to prepare specifications for their construction.

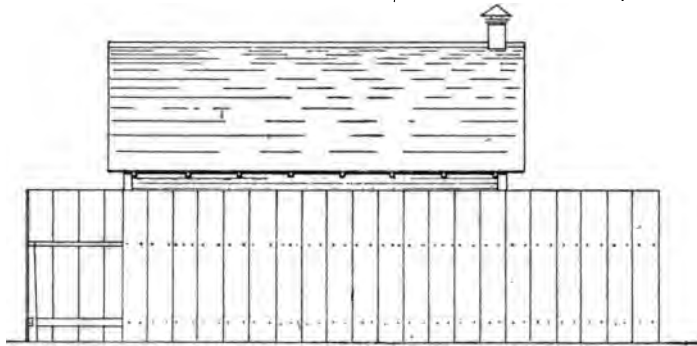
The plans for the one-room building may be executed at a price ranging from \$1,000 to \$2,000; the two-room buildings, from \$1,500 to \$4,000; and the three-room buildings from \$3,000 to \$4,500, according to size and material used.

In addition to these cuts I would refer boards of education to the following places where modern buildings have been constructed, and would suggest that boards of education visit these places and look over the buildings in actual use. The locations are as follows: Mason, Stanton, Cheboygan, Menominee, Escanaba, Ironwood, Port Huron, Ann Arbor, Battle Creek, Hillsdale, Flint, Kalamazoo, Grand Haven, Muskegon, and Ludington.

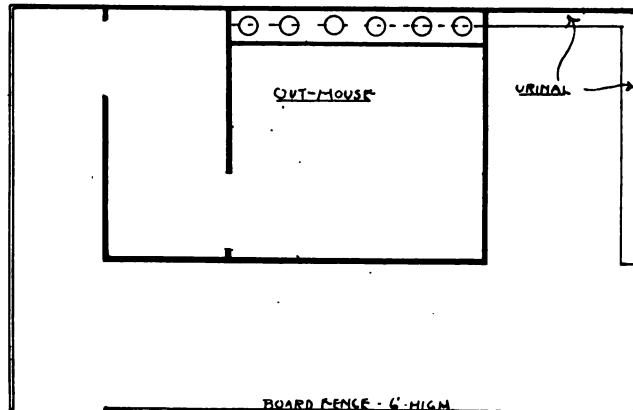
ACKNOWLEDGMENTS.

I take pleasure in acknowledging the assistance received from the School Board Journal of Milwaukee, the firm of White & Butterworth, of Lansing, and from Thomas S. Ainge, sanitary engineer of the Michigan State Board of Health, who have made many excellent suggestions in regard to material contained in this pamphlet and the plans herewith submitted.

L. L. WRIGHT,
Superintendent of Public Instruction.



— ELEVATION $\frac{1}{4}$ SCALE —



PLAN & ELEVATION OF BOY'S CUT-HOUSE

FIG. NO. 1.—OUTBUILDINGS.

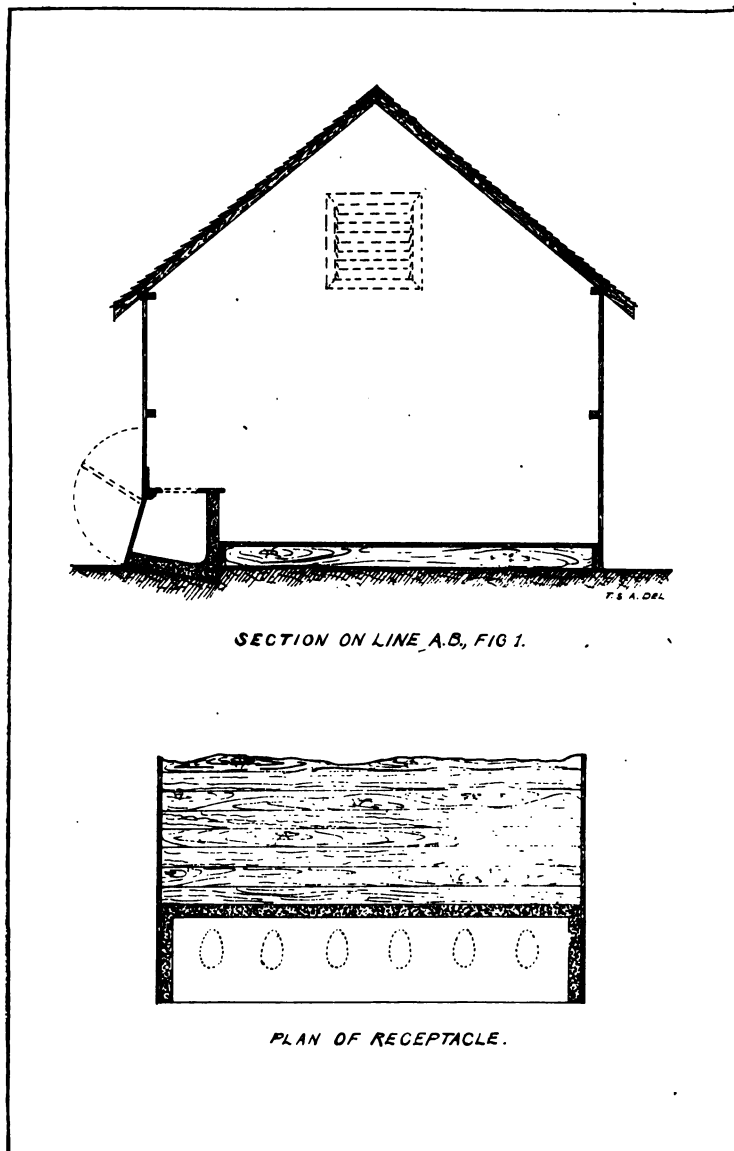
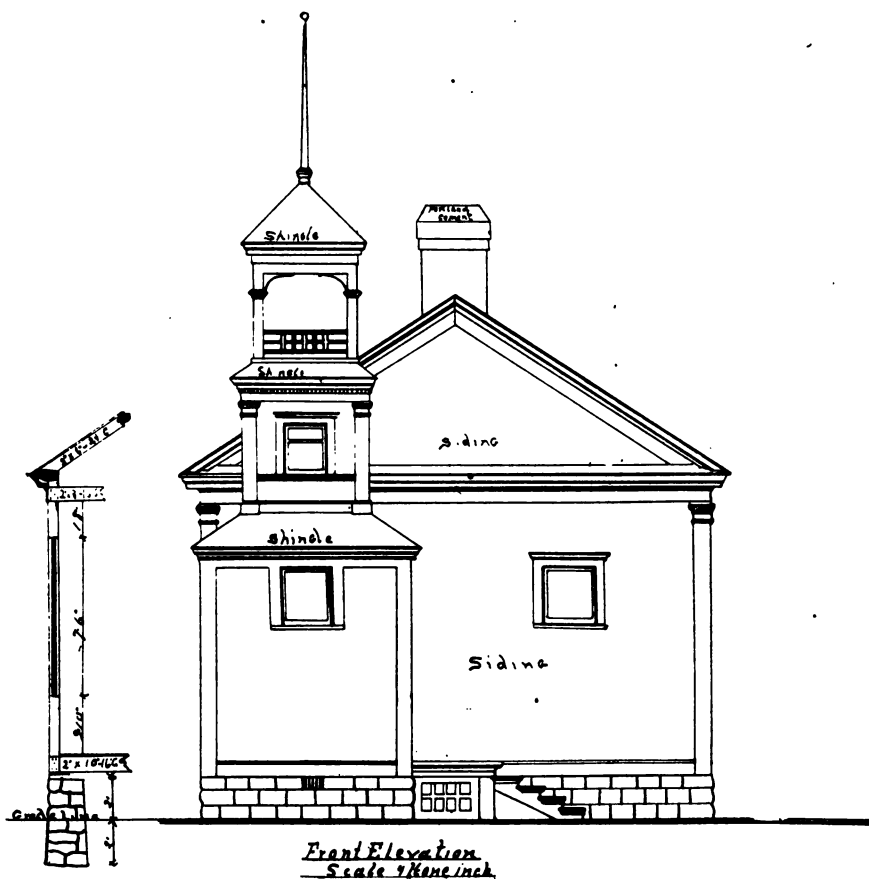


FIG. No. 2.



. FIG. NO. 3.

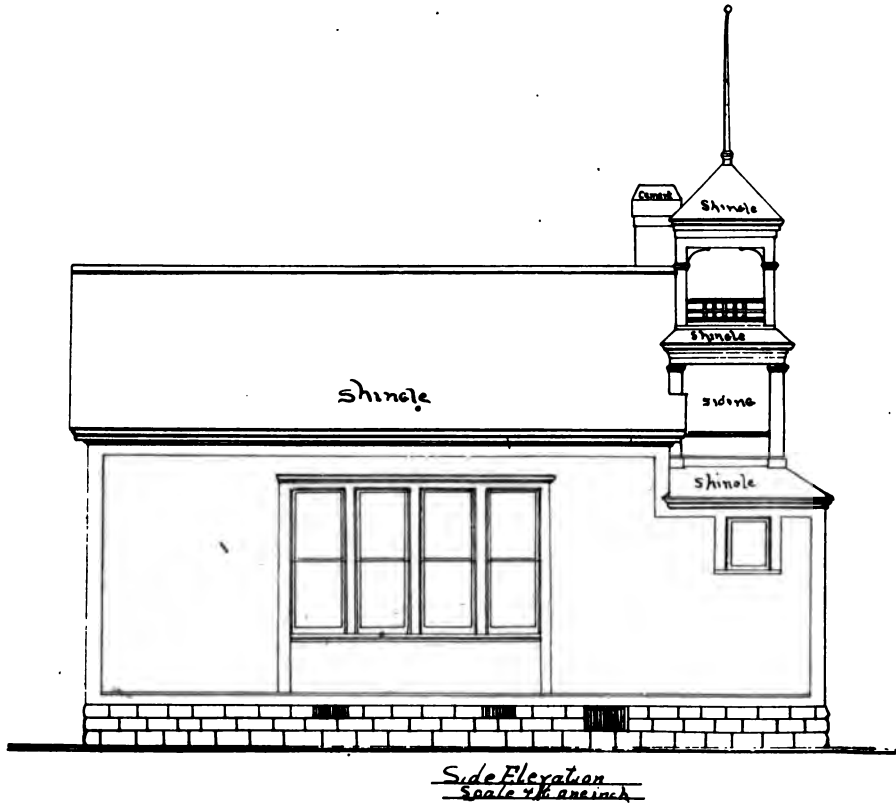


FIG. NO. 4.

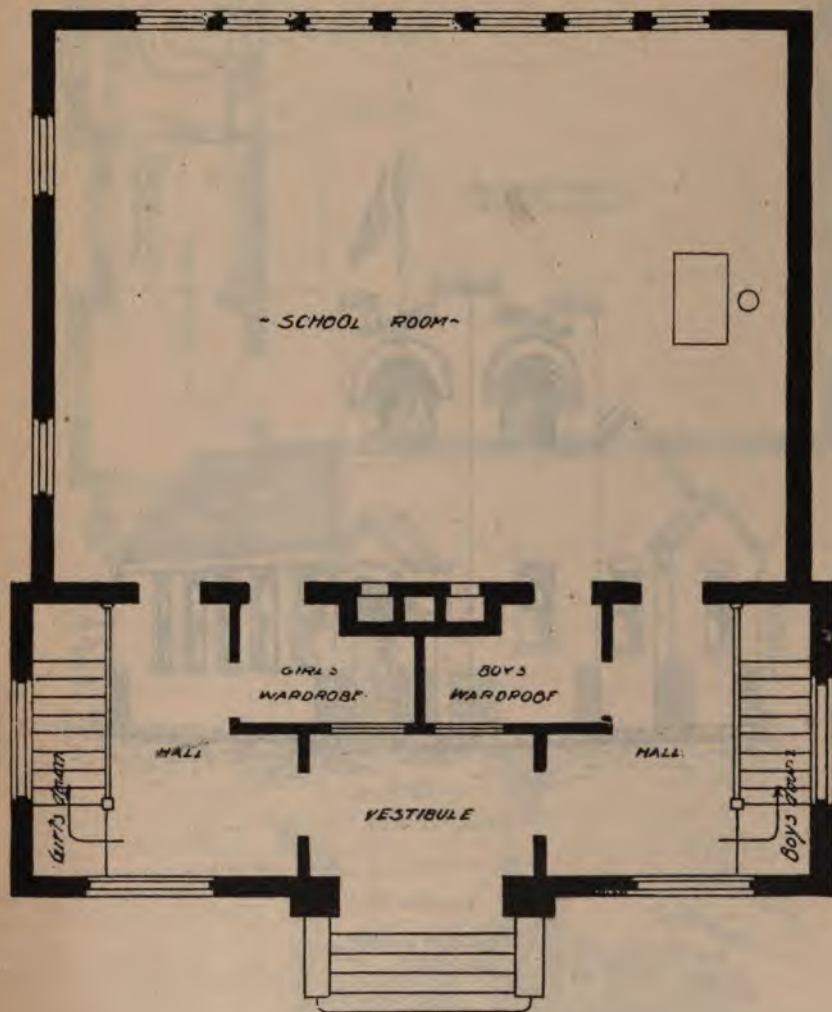
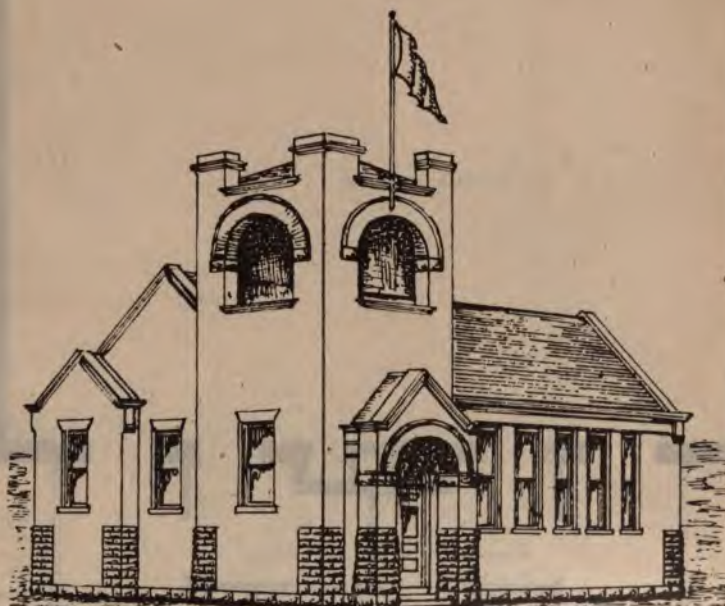


FIG. No. 6.—INDIANA REPORT.

Floor plan of cut No. 5.



PERSPECTIVE

FIG. No. 7.

One room building.

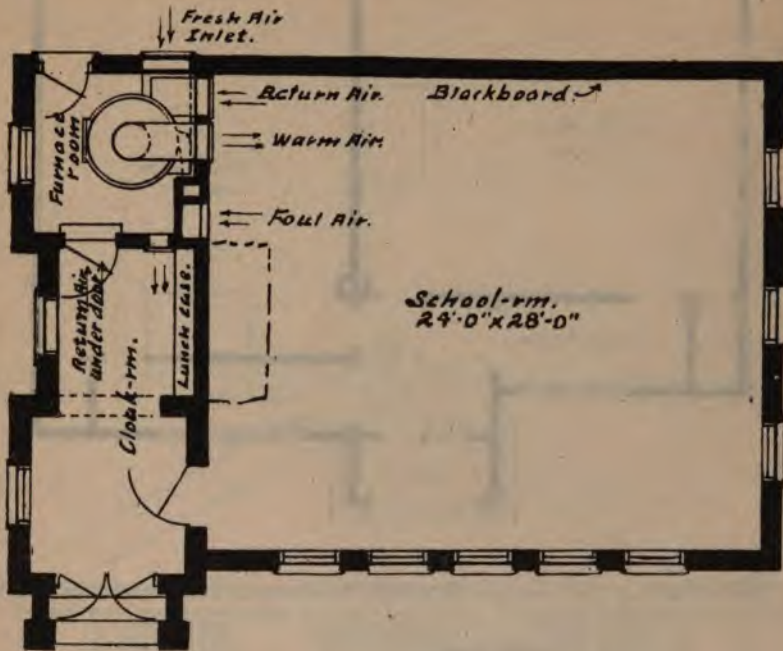


FIG. No. 8.

Floor plan for No. 7.



FIG. No. 9.

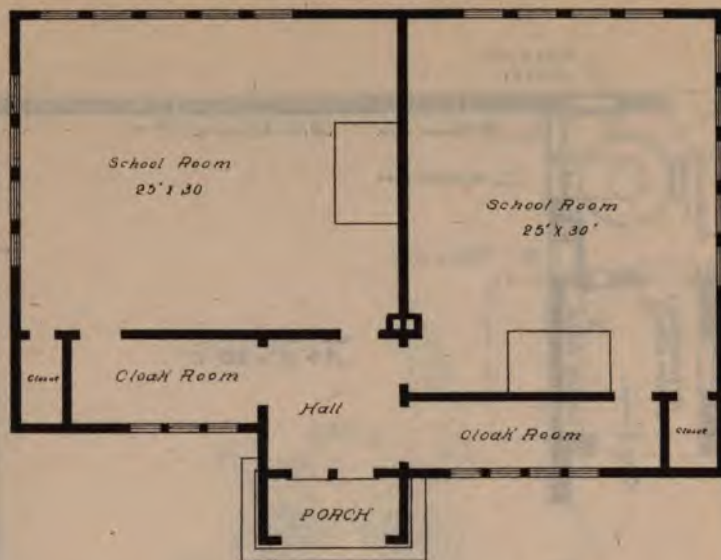


FIG. No. 10.
Floor plan No. 9.



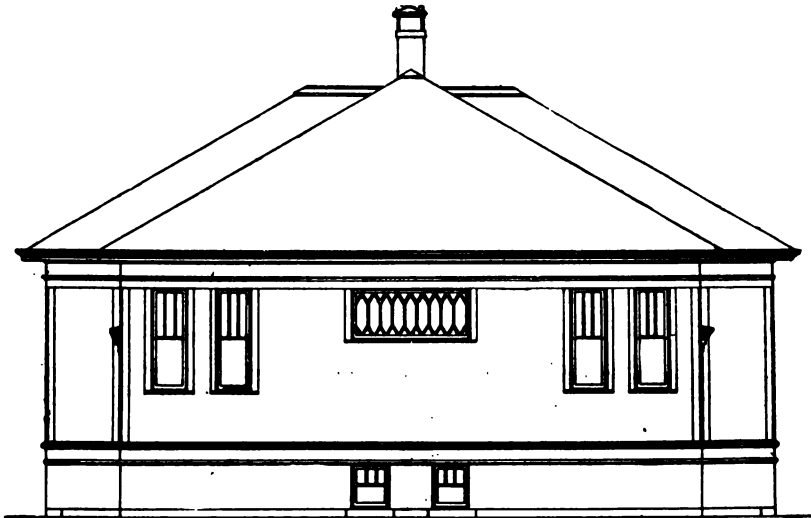
W.R. PARSONS & SON CO.
ARCHITECTS
DES. MOINES, IA - DULUTH, MINN.

SIDE ELEVATION

TWO-ROOM SCHOOL BUILDING
AT
HIBBING - MINN.

SIDE ELEVATION, SHOWING ARRANGEMENT OF WINDOWS.

FIG. No. 11.



W. R. PARSONS & SON CO.
ARCHITECTS
DES. HOMER, IA - DULUTH, MINN.

FRONT ELEVATION

TWO-STORY SCHOOL BUILDING
AT
HIBBING - MINN.

FRONT ELEVATION, NEW SCHOOL BUILDING AT HIBBING, MINN.

FIG. NO. 12.

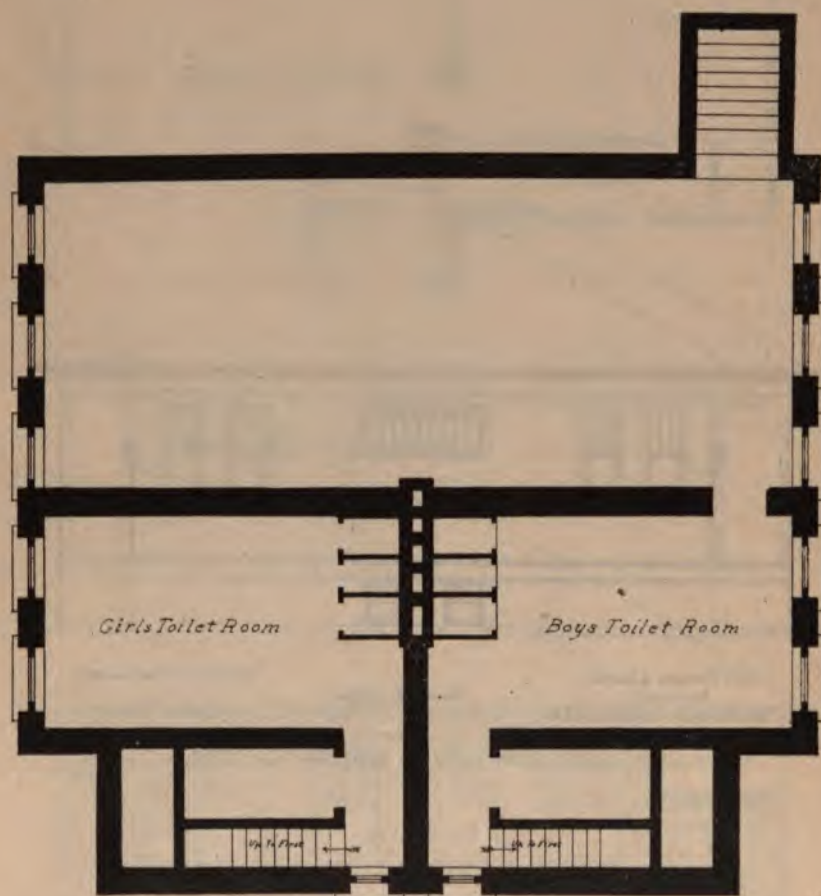


FIG. No. 13.
Basement for Nos. 11 and 12.

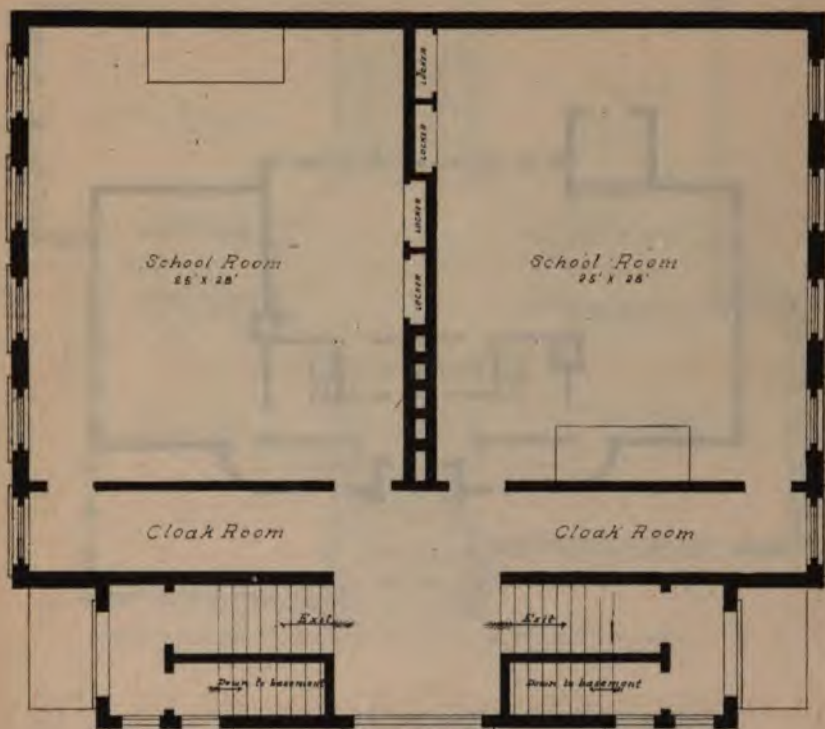


FIG. No. 14.

Floor plan for Nos. 11 and 12.



FIG. No. 15.

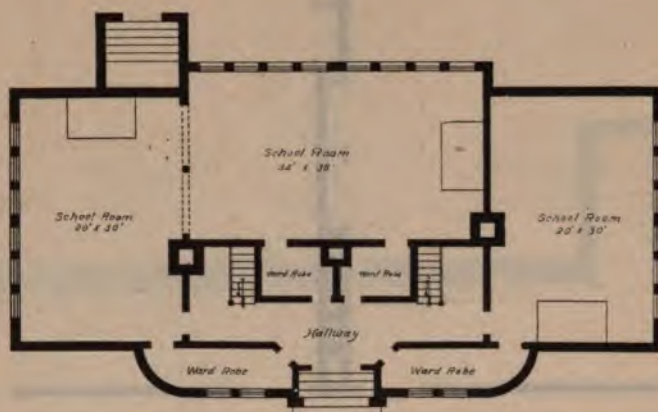
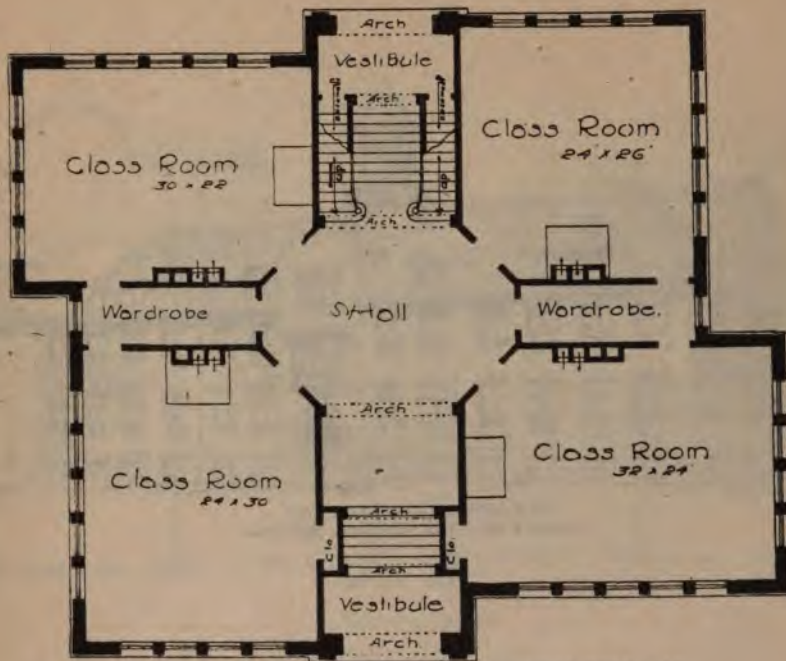


FIG. No. 16.
Floor plan No. 15.

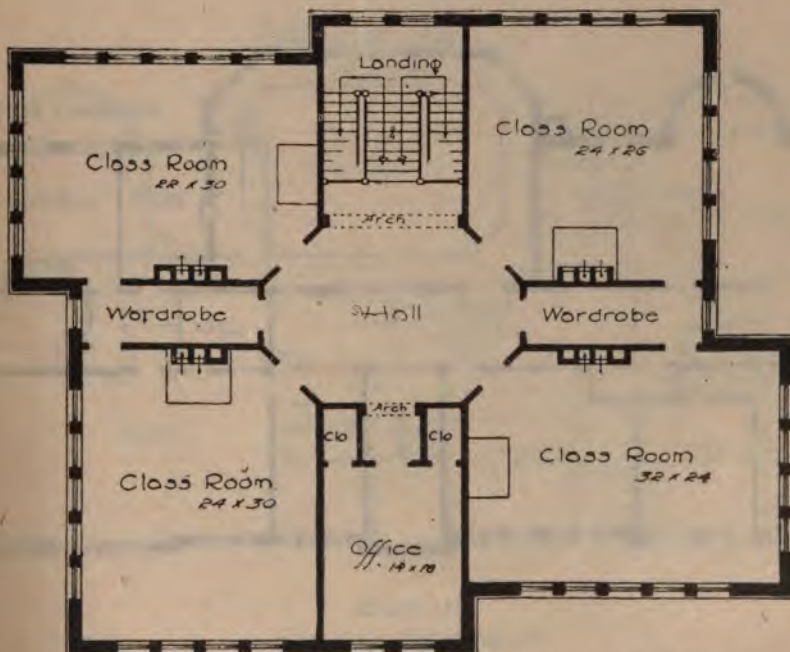


NEW PUBLIC SCHOOL, HARDING TWP., ILL.
Edwards & Walter, Architects

FIG. No. 17.



FIRST FLOOR PLAN, NEW SCHOOL, HARDING TWP., ILL.



SECOND FLOOR PLAN, NEW SCHOOL, HARDING TWP., ILL.



NEW SCHOOL RICE LAKE, WIS.
Van Ryn & De Gelleke, Architects, Milwaukee

FIG. No. 20.

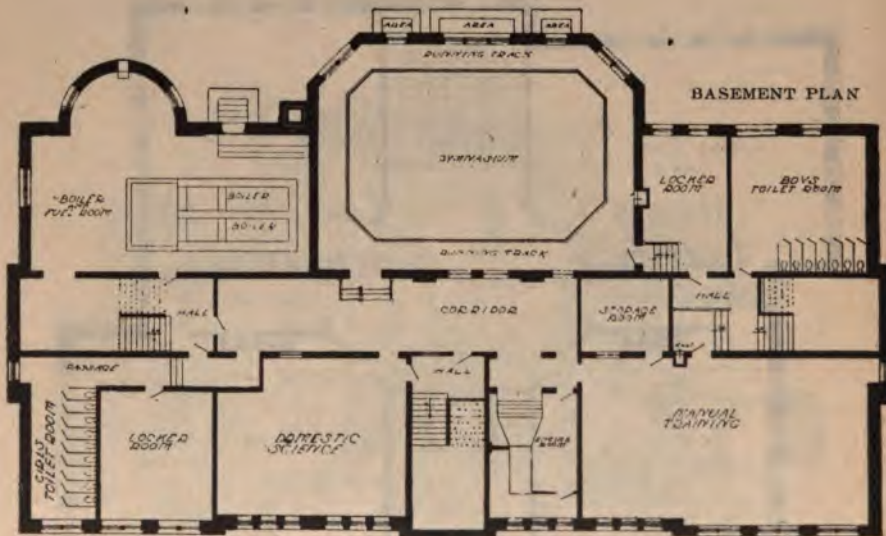


FIG. No. 21.

Basement, Rice Lake school.

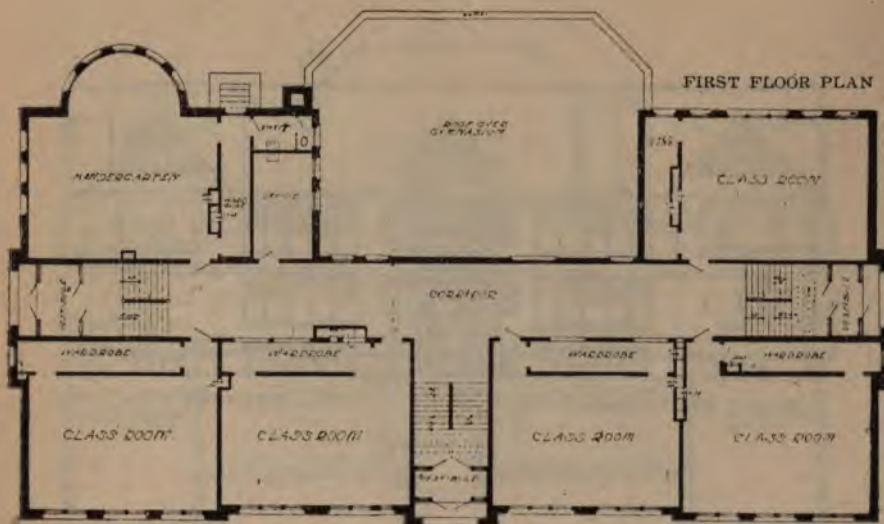


FIG. No. 22.
First floor, Rice Lake school

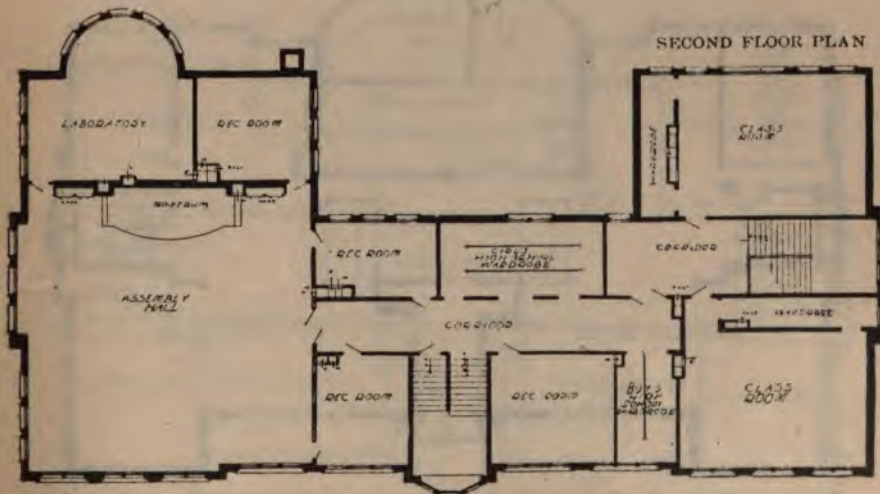


FIG. No. 23.
Second floor, Rice Lake school.



FRONT ELEVATION, KING EDWARD SCHOOL, WALKERVILLE, CAN.

FIG. No. 24.

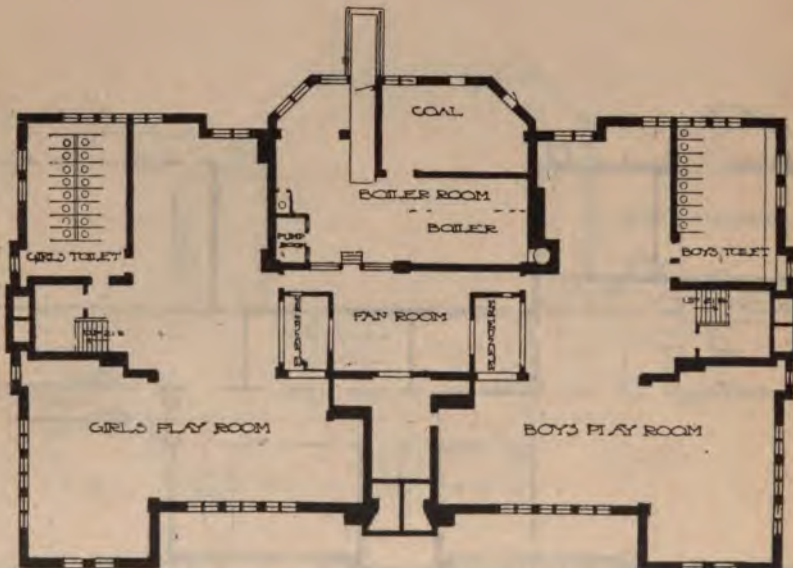
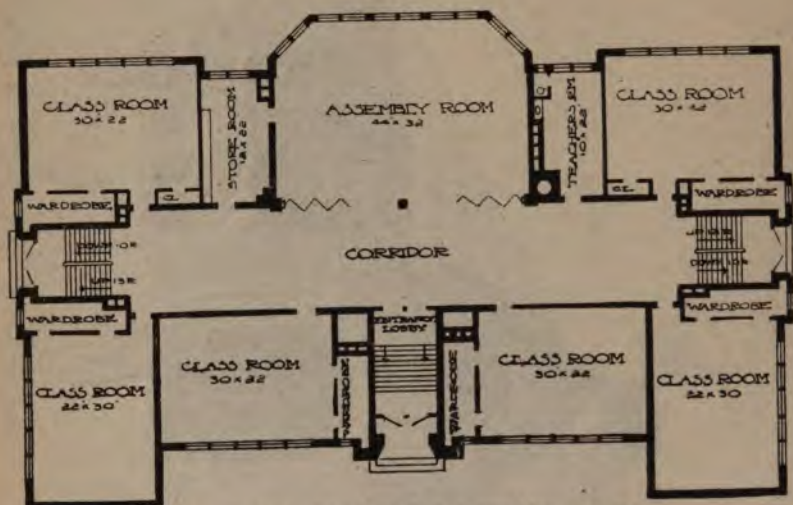
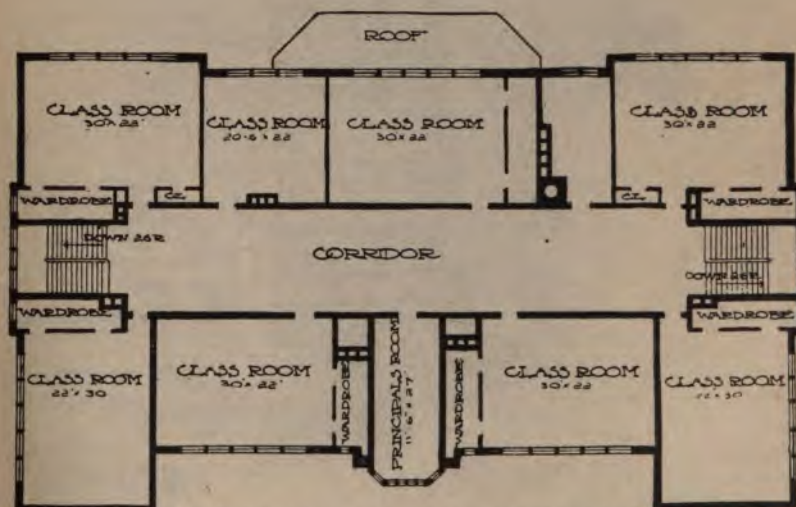
BASEMENT PLAN, KING EDWARD SCHOOL, WALKERVILLE, ONT., CAN.
Albert Kahn, Architect, Detroit, Mich.

FIG. No. 25.



FIRST FLOOR PLAN, KING EDWARD SCHOOL.

FIG. No. 26.



SECOND FLOOR PLAN, KING EDWARD SCHOOL.

FIG. No. 27.

